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ABSTRACT

This study examined the speech behavior of Japanese women when interacting with young children. Sixty-one single Japanese-speaking women, ages 18-26, were recorded as they read aloud picture books to a 1-year-old child and as they conversed with another Japanese-speaking adult woman. When their utterances were acoustically compared between the two settings with regard to prosodic features, both the average pitch and pitch excursions exhibited significant increase when interacting with the child in 17 of the 61 women. In 36 of the remaining 44 individuals, none of the parameters showed such changes. Any retrospective attempt to relate these findings to the individuals' preference for picture books, or previous experience with reading, or with being read the books, or with baby-sitting did not successfully account for the individual variability. The only variable that explained such results was whether the individuals had grown up with siblings or as only children, in that if they were only children, the prosodic modification was significantly less likely to occur. (Contains 22 references.) (MDM)

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Possible Characteristics of Baby-sitting Behavior of Japanese Women Who Have Grown Up as Only Children

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Abstract

Sixty-one single Japanese-speaking women between the ages of 18 and 26 years were recorded as they read aloud picture books to a young child and as they conversed with another Japanese-speaking adult woman. When their utterances were acoustically compared between the two settings with regard to prosodic features, both the average pitch and pitch excursions exhibited a significant increase when interacting with the child in 17 of the 61 women. In 36 of the remaining 44 subjects, none of the parameters showed such changes. Any retrospective attempt to relate these findings to the subjects' preference for picture books, or previous experience with reading, or with being read the books, or with baby-sitting did not successfully account for the individual variability. The only variable that could explain the results was whether the subjects had grown up with siblings or as only children. If they were only children, the prosodic modification was significantly less likely to occur.

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motherese only child prosody baby-sitting

The pioneering study by Ferguson (1964) first offered a coherent description of the linguistic features of child-directed speech. Since then there has been a growing literature on paralinguistic or prosodic features of parental speech to young children. In the languages investigated by Ferguson, which included English, Spanish, Arabic, Comanche, Gilyak, and Marathi, the use of elevated pitch and exaggerated pitch excursions was among the most prominent characteristics observed across cultures. A number of studies since then have reported these characteristics as prosodic features of child-directed speech, although, until fairly recently, most of them have taken the form of unmeasured, subjective estimations of the acoustic quality (Snow, 1972,1976; Berko-Gleason,1973; Blount & Padgug, 1976; Sachs, Brown & Salerno, 1976; Weaver, 1976; Blount, 1977; Sachs, 1977; Kendon, 1978; Coulthard & Brazil, 1981; Wells, 1981; Garvey, 1983).

However, more recently, instrumental measurements of such speech have revealed prosodic modifications essentially comparable across cultures. In a cross-language analysis in French, Italian, Japanese, German, and in British and American English, it was found that fathers as well as mothers modified their prosody when addressing preverbal infants, in comparison with their typical adult-directed speech (Fernald, Taeschner, Dunn, Papousek, de Boysson-Bardies, & Fukui,1989). Based upon these findings, Fernald and her colleagues have argued for the universality of prosodic modifications in speech addressed to infants. Yet, this is controversial and Fernald herself admits that in the Japanese sample included Fernald et al (1989), mothers seemed to show less expansion of the fundamental frequency (F_0) range than in the American and European samples (Fernald,

1992). This could also be the case for the data of the Mandarin Chinese sample obtained by Papousek and Papousek (1991).

Ingram (1995) strongly argued against the universality of prosodic modification. Referring to the work of Ratner and Pye (1984), which measured F_0 in Guatemalan maternal speech to children, he states that their small sample of three Quiche-Mayan speakers did not raise their pitch when addressing children. He proposes that prosodic modifications of child-directed speech are the results of a set of conventions that may vary from culture to culture. Ingram also reinterpreted the data published by Fernald (1987), on adult identification of infant affective states, which was originally used to support the universality of child-directed speech. He sees this as being equally interpretable as the result of a set of culturally transmitted rules. Which explanation is more tenable?

The argument developed by Shute and Wheldall (1989) may be relevant here. Data presented on British women indicate that their child-directed speech is characterized by a smaller increase in average F_0 than that of American women. Furthermore, the average group data masked a wide range of individual differences: for several subjects the average F_0 for child-directed speech was found not to differ substantially from adult-to-adult speech. Since most studies had not discussed individual differences between subjects until then, this may have created an unspoken assumption that raised pitch and exaggerated pitch excursions are typical of all subjects within a cultural-linguistic group. In other words, even within a single cultural-linguistic group, there is a some indication of more variability than has been assumed conventionally. This could, in turn, affect

variability across cultural-linguistic groups.

In this experiment, Japanese women were recorded interacting with a 1-year-old child and with another adult in order to explore this possibility. The results show that some of the subjects exhibit significantly higher pitch and wider pitch excursions when interacting with the child than when interacting with the adult, while the same tendency was not seen in others. Most important, the prosodic modification in child-directed speech is likely to occur with those women that have grown up with siblings, compared with those women that have grown up as only children.

Sixty-one women between the ages of 18 and 26 year (M=19.5) served as subjects. All of them met the following requirements: single, no children, Japanese as first language. At least until the age of18 years, all the subjects had lived with their biological parents. Each subject was recorded in a small carpeted interview room as she read aloud one of the seven picture books (each approximately 20 pages long) to a child (adult-to-child sample) and as she conversed with another Japanese-speaking adult woman (adult-to-adult sample). All the subjects were observed when interacting with the same child-adult dyad, who were unfamiliar to them. When the study started, the adult and the child were 30 years old and 19 months old, respectively. The entire experiment was conducted over a subsequent 7-month-period. For a given subject, either of the seven books was randomly chosen. The subject was seated in a chair at right angles to the seated child. Thereafter she was asked to read aloud the book to the child as she normally might if they were alone together. She wore a high quality lapel microphone (Sony ECM-150), which was connected to a portable tape recorded (Sony TC-

D5M). The subjects were told that their reading of the books was of interest, but they were not specifically told that characteristics of its prosodic features would be analyzed.

Reading usually took 4 to 5 minutes. After that, the subject was required orally to respond to a standard set of open-ended questions or her views about the role of reading books aloud to young children in their cognitive development. This provided the adult-to-adult sample. During the interview, the following 7 questions were asked, too. They were: (1) How old are you? (2)Do you like playing with young children? (3)How often have you had experience with baby-sitting? (4) Do you like reading picture books? (5) How often have you experienced being read picture books? (6) How often have you experienced reading picture books by yourself? and (7) How many siblings do you have? For Question 2 to 6, they were required to answer, using five-point scales. For Question 2 and 4, they were 1= very much and 5= not at all; for Question 3, 5 and 6, 1= very often and 5= very rare.

An "utterance" was operationally defined as a continuous vocalization of a subject bounded by pauses of longer than 0.3sec. Thus two complete run-on sentences without an intervening pause were regarded as an utterance. From the adult to-child sample obtained in the reading setting and the adult-to-adult sample, each of 10 such utterances were randomly chosen for each subject. With respect to each of the utterances, the average F_0 and the F_0 range were measured, using a Kay DSP Sonagraph (Model 5500-1) with 150Hz filter and frequency scale up to 4000Hz. Thereafter, differences of the values of the two parameters between the samples were statistically examined, using two-tailed Mann-Whitney U tests at the level

of significance, $p<.05$. Based on these criteria, the subjects were operationally classified into three groups. That is, those in which both the average F_0 and the F_0 range significantly increased in adult-to-child sample in comparison with the adult-to-adult sample, those in which either the average F_0 or the F_0 range showed such an increase, and those in which none of the parameters differed between the samples.

Insert Table 1 about here

Results of the analysis are summarized in Table 1. Among the 61 subjects, both the average F_0 and the F_0 range exhibited a significant increase in the adult-to-child sample in 17 women. In another 8 subjects, either one or the other of the two parameters showed the increase while in the remaining 36 subjects, none of the parameters differed between the samples. The subjects' answers to the interviews were compared retrospectively across the three groups and statistically examined, using Kruskal-Wallis one-way analyses of variance. No significant differences were found with respect to Question 1 to Question 6. Only to Question7 did the scores significantly differ across the cohorts. In the cohort where modifications were recorded in terms of both the average F_0 and the F_0 range, the mean number of siblings was the greatest, while it was the smallest in the subject group where neither of the two acoustic parameters showed a significant difference between adult-to-adult and adult-to-child samples. Of the 61 subjects included in the present study, 19 had grown up

as only children. Of the remaining 42, 34 had grown up with one sibling and 8 with two siblings. In 16 of the 19 only children, none of the acoustic parameters differed significantly between adult-to-adult and adult-to-child samples (84.2%). The rate was 52.9% for those subjects that had grown up with one sibling (18 out of the 34), and 25.0% for those subjects that had grown up with a couple of siblings (2 out of the 8). These scores were statistically significantly different across the three cohorts ($\underline{X}^2(2)=9.33$, $\underline{p}<.01$). Since the present investigation was undertaken over an 8-month-period, it is possible that as the child to whom the picture books were read aloud grew older, the subjects might become less likely to exhibit prosodic modification in their child-directed speech. Such a change may have biased the result of our experiment. To test this possibility, the percentage of those subjects that did not show the modification in both acoustic parameters was computed in each of the four quareters of the study period. However, there was not a significant difference of the scores among the quareters ($\underline{X}^2(3)=2.28$, $\underline{p}>.10$). The percentage of only children served as subjects was also computed in each of the four quarters. However, again, there was not a significant difference among the scores ($\underline{X}^2(3)=2.30$, $\underline{p}>.10$).

The present experiment clearly demonstrates a fairly wide individual variation in terms of prosodic modification in Japanese women when reading aloud a picture book to a child. Any retrospective attempt to relate these findings to the subjects' preference for picture books, previous experience with reading books, being read books, or with baby-sitting did not successfully account for the individual differences. The only

variable that could have effects on the variability was whether the subjects had grown up with siblings or as only children. If they were only children, the prosodic modification was significantly less likely to occur.

Since several objective investigations of birth order and family size conducted during the 1920s (e.g. Fenton, 1928), hundreds of studies have been published in psychological, medical, sociological, and educational journals in Europe and North America, comparing the personality and social outcomes of only children to that of their peers with sibling. Falbo and Polit (1986) reviewed over 500 of these studies and grouped the many personality and social attributes included in them into 16 categories. It was found that only 2 of the 16 attributes yield statistically significant results. They were that only children score higher than others on achievement motivation and on self-esteem. However, for the other 14 attributes, only children scored similarly to those who have siblings, and seem to be no different from others on a variety of significant attributes, including their dominance, generosity, autonomy, anxiety, and peer popularity. Therefore, until now, the general consensus has been that siblings certainly have an impact on children's development, but that this impact is limited to those children who have siblings. The absence of siblings can be compensated for by others, particularly by parents.

The present findings could possibly be very intriguing on this matter, since women who have grown up as only children may lack "motherese". Undoubtedly, the individual variability found here could be associated with a number of other variables than whether the subjects were only children or

not. Further research controlling such variables is currently in progress. Moreover, in the present study, the subjects were recorded reading aloud a book to a child, and their utterances were subsequently compared acoustically with conversation with another adult. However a recent study (Shute & Wheldall,1989) reports that prosodic modification occurs more distinctly when conversing with than when reading to infants, which should be taken into account. Nevertheless, the fact should be noted that the most distinguishing feature of this experiment lies in its use of direct observation of behavioral attributes of only children, whereas in virtually all of the previous works, questionnaires or inventories were exclusively employed. The preliminary results obtained from such behavioral observations suggest that the adult-child interactions may be different according to the presence or absence of siblings. Alternatively, women growing up as only children may have more difficulty to express affective emotions when interacting with children. The present study suggests that to elucidate such behavioral characteristics of only children, the measurement of child-directed speech could possibly be an effective tool.

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TABLE 1

Retrospective Comparison of Responses to Seven Questions among Three Cohorts Classified on the Basis of the Results of Acoustical Analyses

Question	Cohort			
	Both parameters modified (n=17)	Either of the parameters modified (n=8)	None of the parameters modified (n=36)	H
1. How old are you?	19.3 (1.5)	19.6 (1.8)	19.6 (1.8)	.69
2. Do you like playing with young children?	2.5 (0.8)	2.0 (0.8)	2.2 (1.0)	.86
3. How often have you had experience with baby-sitting?	3.8 (1.2)	3.1 (1.6)	3.2 (1.4)	2.77
4. Do you like rading picture books?	1.5 (0.8)	1.5 (0.8)	1.6 (0.9)	.01
5. How often have you experinced being read picture books?	2.1 (1.4)	1.1 (0.4)	1.5 (1.0)	2.78
6. How often have you experinced reading picture books by yourself?	3.5 (1.3)	3.8 (1.6)	3.4 (1.4)	.60
7. How many siblings do you have?	1.2 (0.6)	0.9 (0.6)	0.6 (0.6)	10.80*

Note. Standard deviations are shown in parenthesis.

*$p < .05$

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